



The StormTreat System: A New Stormwater Runoff Treatment

by Scott W. Horsley, StormTreat Systems, Inc.

Frequently, stormwater runoff from various land uses—such as roadways, lawns, gas stations—is combined in a drainage ditch or stormwater pipe, which ultimately discharges to receiving waters. However, the pollutants from these different sources are diverse in their composition and quantity. Stormwater management is best accomplished by techniques that treat each area within the watershed independently as opposed to the more conventional “big pipe” solution, where a large detention/pond is constructed at the bottom of a watershed in an attempt to catch and treat all of the stormwater generated by the watershed. The big pipe approach is land-intensive and costly.

A Self-Contained, On-Site System

A new stormwater technology, StormTreat System, has been designed to capture and treat the first flush of runoff by being positioned high in the watershed and near the pollution sources. StormTreat incorporates sedimentation, filtration, and constructed wetlands into a modular, unitary 9.5-foot diameter structure. The number of units at each location is determined by the design storm, the size of the sub-drainage area, and the detention volume within the drainage infrastructure.

The StormTreat System is significantly smaller (usually five to 10% of the treated area) when compared with conventional stormwater ponds or wetlands. Where land costs are high or difficult site constraints exist, this size efficiency can represent significant cost savings. Discharge from the system is slow enough for either surface or groundwater discharge and so can be located in low-permeability soils with a high water table. StormTreat does not have standing water, which is common in conventional stormwater ponds and can be unsightly, unsafe, or encourage mosquito breeding (see article 100).

The StormTreat System consists of a series of 9.5-foot diameter recycled polyethylene tanks (Figure 1), resistant enough for brackish environments and self-anchored to compensate for high groundwater conditions. The tanks connect directly to existing drainage structures, most commonly the catch basins. While designed to intercept the first flush - typically half an inch of rain - the system can be sized to accommodate any size storm event. Any surplus runoff bypasses the system. Inlet pipes may be adapted to fit existing storm drainage pipes, paved swales, and other settings.

Operation

The internal sedimentation chambers contain a series of bulkheads fitted with filter screens (Figure 2). A series of “skimmers” are also utilized to selectively decant the upper portions of the stormwater in the sedimentation basins, leaving behind the more turbid lower waters. After moving through these internal chambers, the partially treated stormwater passes into the surrounding constructed wetland through a series of slotted PVC pipes. The wetland is comprised of a sand and gravel substrate planted with cattails, bulrushes, and burreeds. An outlet control valve provides a five-day holding time within the system. The valve can be shut off in the event of a hazardous waste spill. It can also be closed at the end of the rainy season in arid zones to preserve the mini-wetlands. Unlike most constructed

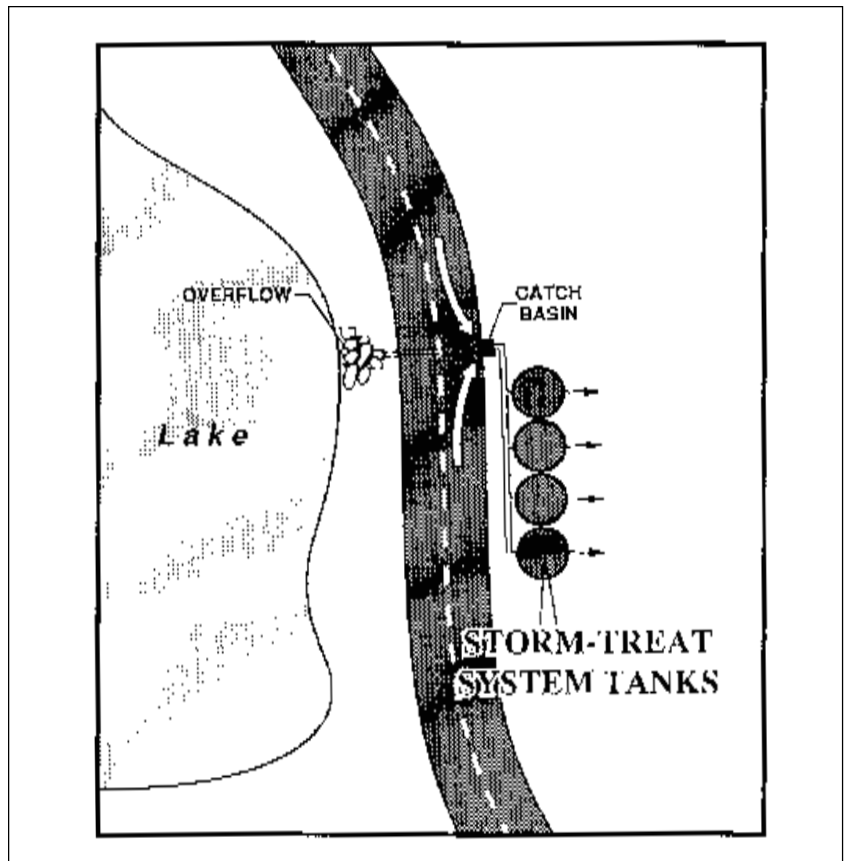


Figure 1: Typical Layout of StormTreat System